



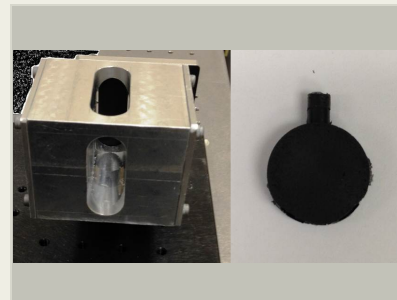
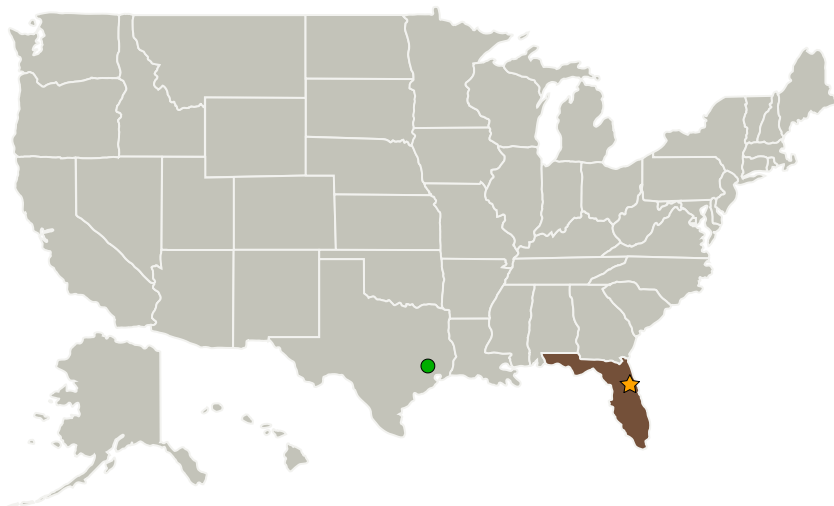
## Project Introduction

This project seeks to develop and evaluate novel advanced composite materials which contain magnetic nano-particles. The primary goal is to develop a new class of lightweight magnetic materials. During this project, several key technical challenges will be investigated, including development of robust methods to produce magnetic nanoparticles, synthesis of novel polymers and other matrix materials to improve composite magnet performance and durability, and development of alignment methodologies for magnet fabrication.

## Anticipated Benefits

This work primarily aligns with NASA Technology Area TA12: Materials, Structures, Mechanical Systems and Manufacturing, and is expected to impact space power and energy storage through its impact on flywheels. Additionally, the development of lightweight magnetic materials will reduce the mass of space operations, thereby increasing the weight available for other systems.

## Primary U.S. Work Locations and Key Partners



Magnetic alignment apparatus and proof-of-concept specimen using resin mold and magnetic micro-particles to evaluate molding techniques for composite magnets

## Table of Contents

Project Introduction	1
Anticipated Benefits	1
Primary U.S. Work Locations and Key Partners	1
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	3
Technology Areas	3

## Magnetic Nano-particle Based Composite Materials/Magnets (MNPC)



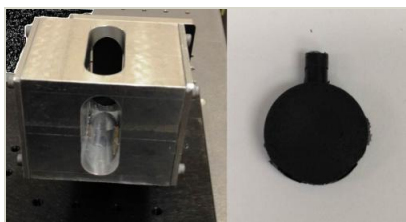
Completed Technology Project (2013 - 2014)

Organizations Performing Work	Role	Type	Location
★ Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
Florida Agricultural and Mechanical University(FAMU)	Supporting Organization	Academia	Tallahassee, Florida
Florida Institute of Technology	Supporting Organization	Academia	Melbourne, Florida
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

## Primary U.S. Work Locations

Florida

## Images



**Magnetic alignment apparatus and proof-of-concept specimen to evaluate molding techniques for composite magnets**

Magnetic alignment apparatus and proof-of-concept specimen using resin mold and magnetic micro-particles to evaluate molding techniques for composite magnets (<https://techport.nasa.gov/image/2524>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Kennedy Space Center (KSC)

**Responsible Program:**

Center Innovation Fund: KSC CIF

## Project Management

**Program Director:**

Michael R Lapointe

**Program Manager:**

Barbara L Brown

**Project Manager:**

Nancy P Zeitlin

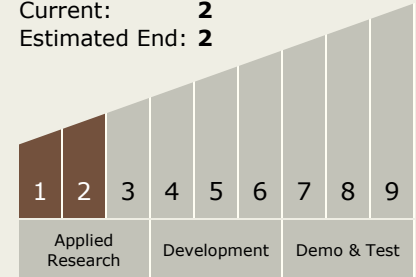
**Principal Investigator:**

Martha K Williams



## Technology Maturity (TRL)

Start: **1**  
Current: **2**  
Estimated End: **2**



## Technology Areas

### Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - └ TX12.1 Materials
    - └ TX12.1.1 Lightweight Structural Materials